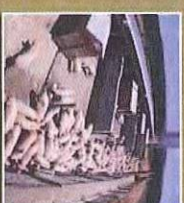
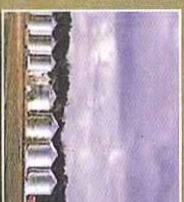


Illinois Farmland Assessment Process

*March 9, 2012
Champaign, Illinois*

*Bruce J. Sherrick
University of Illinois
Dept. of Ag and Consumer Econ.*



Illinois Farmland Assessments (PA 82-121)

- Current Law Implemented in 1981, minor updates
- *Use Valuation* approach (common in most MidWest states for ag land, various forms)
- Considered *preferential* relative to **Market Value**
- Tied to productivity index of soils, prevalent crop rotations, and average prices and costs over previous **five-year rolling windows**, no government payments, with 10% limits on change
- Gross return less non-land cost calculated at **each point** on the PI scale to arrive at *income potential*

Illinois Farmland Assessments (*continued*)

- *Income potential* is then capitalized by 2032a rate to determine Ag Use Value (AUV)
- AUV divided by 3 to arrive at Equalized Assessed Value or EAV
- **EAV changes limited to +/- 10% annually, by PI**
- Points on PI scale below lowest cropped land have straight line relationship down to 1/6 of lowest PI
- Implemented on soils-weighted (rather than parcel weighted) basis, a few difficulties remain.

Illinois Farmland Assessments (*continued*)

– Applies to:

- Cropland
 - Permanent Pasture
 - Other farmland
 - Wasteland
- } PI-based

• *Related: Woodland areas – but complicated taxonomy that is not particularly satisfying*

– Acre weighted SEF basis, Soil classifications
SSURGO – UI listing (Bulletin 810 from 1156)

Illinois Farmland Assessments (*continued*)

Some details that matter:

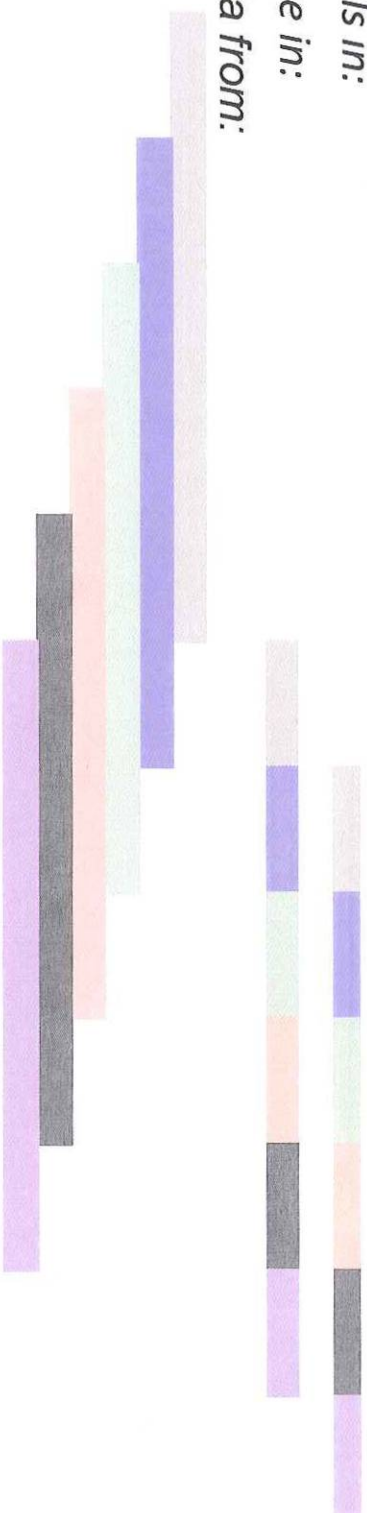
Time Line Schematic:

2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011

For tax bills in:

Calc's done in:

Using data from:



Illinois Farmland Assessments (*continued*)

- FBFM Certified Grain Farm Records used as basis for nonland costs (NLC), crop rotations, and property taxes paid. Accounting data are of very high quality.
- Large number of acres, PI points, etc., summarized at each PI point each year for actual costs and returns information, Gross Return (Gross) weighted by acres in corn, soybeans, wheat, oats, hay, sorghum.
- Yield functions for an “average” producer at each PI point for each crop, with time trend reflected.
- Numerous record keeping changes by FBFM through time have been reflected in process.

Illinois Farmland Assessments (*continued*)

- *FBFM* data (about 2,600 records per year, 5 years in each set) on *operated acre* basis to accurately reflect differences in lease types through time.
- Yields standardized at 810 scale adjusted for time (good or bad management does not affect income potential). Examples for 125 PI farm:

Yield Models							
	Corn	Soybeans	Wheat	Oats	Hay	Sorghum	
Year	2011	186.09	51.54	65.72	84.67	5.65	120.59
PI	125						

Crop Rotations vary little through time....

Percentage of acres by crop/year:

Year	Corn	Soybeans	Wheat	Oats	Hay	Sorghum
2000	49.8%	47.6%	1.7%	0.1%	0.7%	0.1%
2001	49.8%	47.9%	1.5%	0.0%	0.8%	0.1%
2002	50.3%	47.4%	1.4%	0.1%	0.6%	0.2%
2003	51.2%	45.4%	1.8%	0.1%	1.2%	0.2%
2004	53.1%	43.0%	2.3%	0.1%	1.4%	0.1%
2005	55.5%	41.3%	1.6%	0.1%	1.3%	0.1%
2006	52.8%	43.3%	2.4%	0.1%	1.3%	0.1%
2007	61.1%	35.2%	2.3%	0.1%	1.2%	0.1%
2008	57.4%	38.6%	2.7%	0.1%	1.2%	0.1%
2009	56.7%	40.0%	2.2%	0.1%	1.1%	0.1%
2010	57.1%	41.0%	0.8%	0.1%	1.0%	0.0%

Prices used in average do vary through time.... *Example Corn Averaging Process*

Monthly Average Corn Farm Price Received in Illinois
for the 2000 - 2011 Calendar Year(s)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg*
2000	1.97	2.03	2.11	2.02	2.20	1.89	1.66	1.54	1.64	1.80	1.92	2.03	1.90
2001	1.97	2.00	2.00	1.92	1.86	1.83	1.95	1.99	1.94	1.85	1.91	2.06	1.94
2002	2.01	1.98	1.98	1.96	2.00	2.05	2.24	2.47	2.50	2.36	2.33	2.37	2.19
2003	2.37	2.35	2.36	2.40	2.43	2.39	2.20	2.16	2.18	2.13	2.21	2.34	2.29
2004	2.37	2.65	2.77	2.97	2.93	2.87	2.49	2.35	2.20	2.22	2.08	2.17	2.51
2005	2.23	2.02	2.09	2.09	2.05	2.12	2.23	2.03	1.92	1.83	1.87	2.01	2.04
2006	2.06	2.08	2.12	2.20	2.26	2.28	2.28	2.15	2.20	2.62	3.01	3.00	2.36
2007	3.01	3.44	3.52	3.48	3.52	3.64	3.32	3.16	3.21	3.31	3.53	3.73	3.41
2008	3.88	4.58	4.69	5.15	5.25	5.71	5.43	5.17	4.99	4.29	4.11	4.09	4.78
2009	4.34	3.75	3.74	3.81	3.95	4.01	4.10	3.32	3.27	3.59	3.55	3.56	3.70
2010	3.63	3.48	3.53	3.42	3.49	3.41	3.51	3.73	4.05	4.52	4.62	4.86	3.85
2011	4.94	5.64	5.73	6.68	6.65	6.56	6.57	6.96	6.09	5.87	5.90	5.92	6.13
2012	...												

Aves

Prices used in average do vary through time....

- Recent higher prices replace older lower prices in 5-yr ave process.
- Corn and Soybean weights dominate the process
- Cost side somewhat parallel movements, but not fully

Calendar Year Average Prices			
Year	Corn \$/Bu	Soybeans \$/Bu	Wheat \$/Bu
2004	\$2.51	\$7.51	\$3.41
2005	\$2.04	\$6.02	\$3.19
2006	\$2.36	\$5.75	\$3.62
2007	\$3.41	\$7.97	\$5.17
2008	\$4.78	\$11.66	\$6.67
2009	\$3.70	\$10.29	\$4.27
2010	\$3.85	\$10.14	\$5.09
2011	\$6.13	\$12.79	\$6.86
Ave 06-10	\$3.62	\$9.16	\$4.96
Ave 07-11	\$4.37	\$10.57	\$5.61

- expect higher gross returns for some period in future

Capitalization Rate based on 2032(a) for Illinois

2032a Rate	Year	Rate
(01-05)	2006	0.0644
(02-06)	2007	0.0602
(03-07)	2008	0.061
(04-08)	2009	0.0638
(05-09)	2010	0.0650
(06-10)	2011	0.0641

*

* No estate tax rate published originally by IRS, recently released for use in 2011 for 2010 values.

Putting the components together...

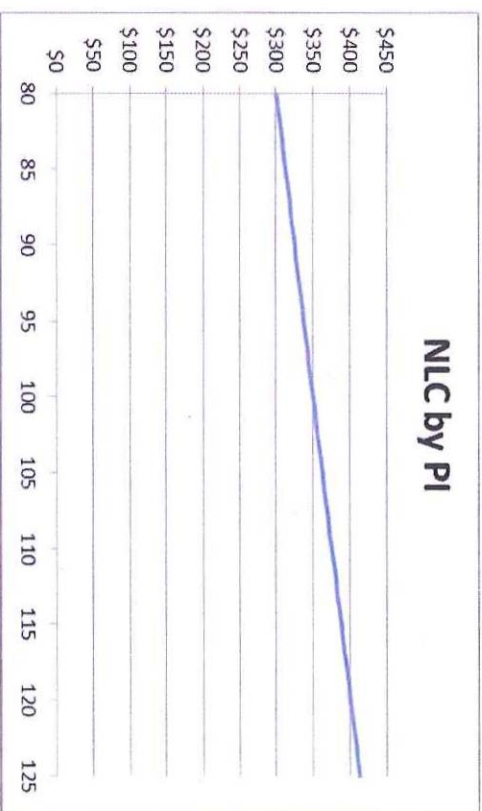
- FBFM operated acre records used
 - (50% share on 100 acres +50 acres owned =100 operated acres)
- $Y_e \times P_e \times S_e + Y_s \times P_e \times P_s \dots$ across crops used to get gross income potential using each year's data.
- Weighted by rotations, each observation w/PI
- NLCs from accounting data (not allocated at crop level) for each operator record
- LR calculated = Gross-NLC – importantly, these are observations at each farm with associated PI
- Must summarize the LR by SPI relationship

(Stacked 5-yr data sets each assessment year)

Putting the components together...



-

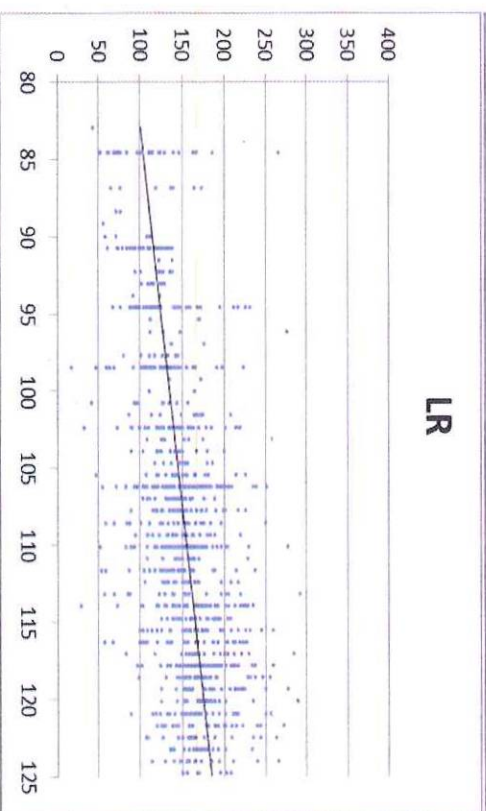


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Gross less NLC = LR

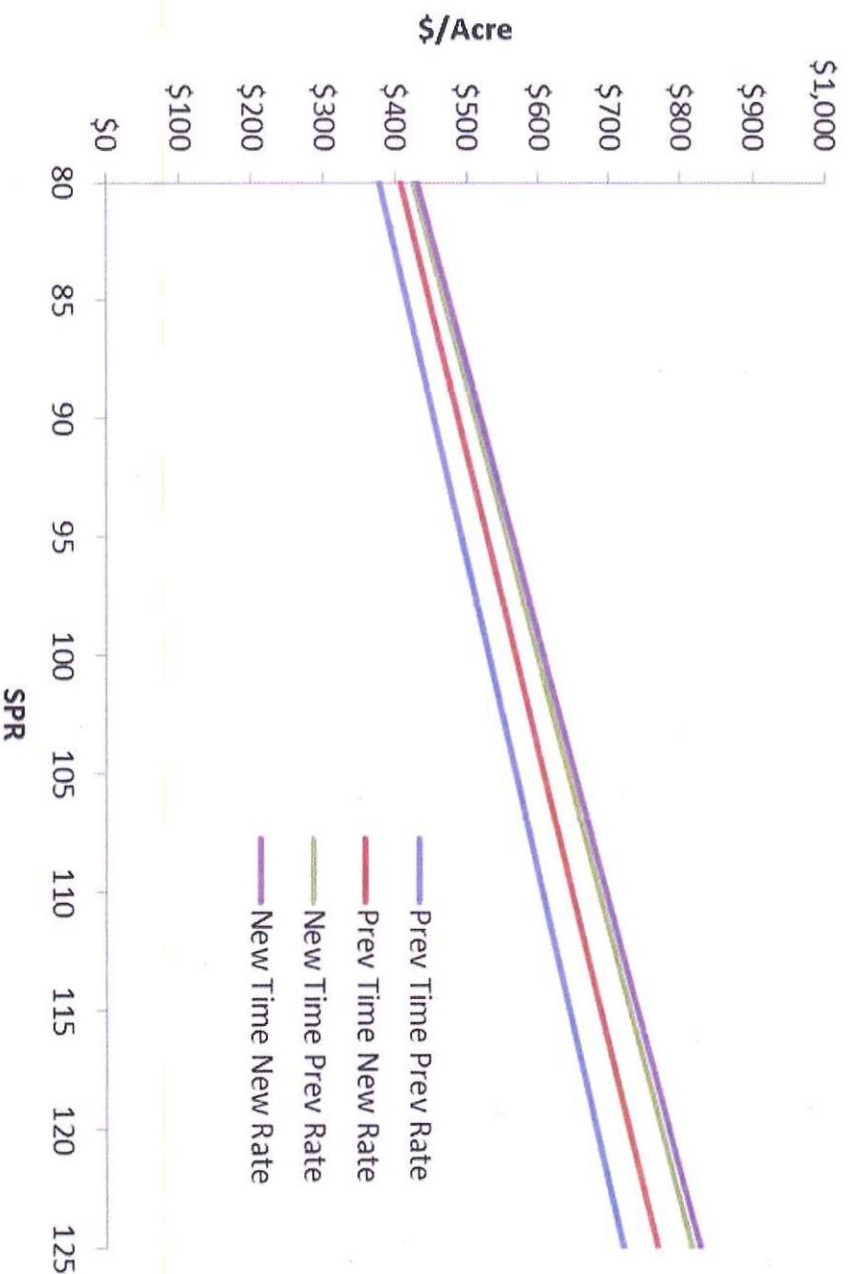
Summarized at Each PI by regression across FBFM data.

Matches closely with direct land income (operator charges for unpaid labor differ, etc.).



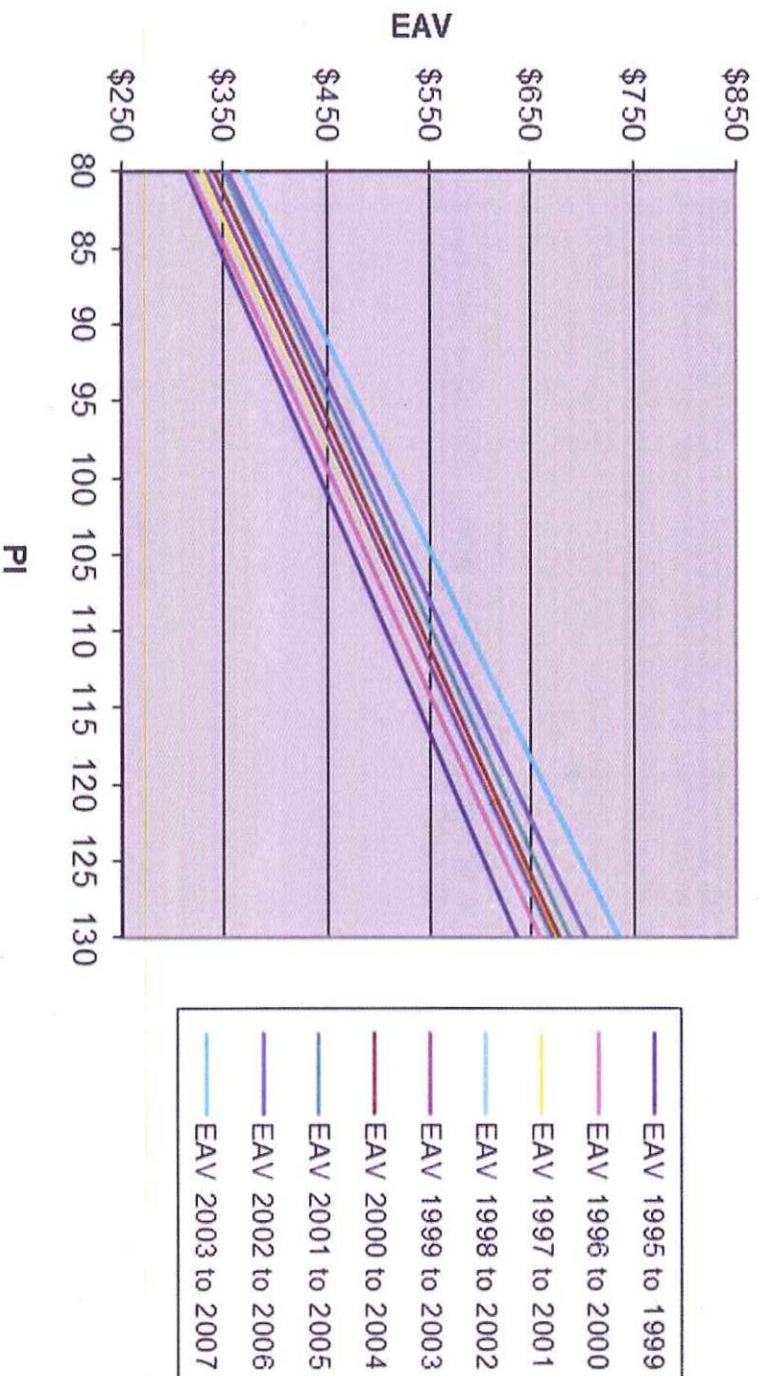
Yearly Change decomposition '10-'11

EAV Change Analysis



Fairly stable summary through time

EAVs by 5 year interval



Recapping the steps so far...

1. *Gross* calculated using rolling average income potential for SPI given rotations, prices, yield functions.
2. $LR_{t, SPI} = \text{Gross-Non Land Costs}$ – using FBFM data
3. Summarized over all records and years to get *LR* by SPI
4. *LR* converted to *AUV* = LR/r where *r* is the 2032(a) rate
5. *AUV* converted to base *EAV** by dividing by 3
6. *EAV** is then subjected to test for movement from previous year's $EAV_{cert} = \min(\max(LL, EAV^*), UL)$ where *LL* is previous $EAV^* \times .9$ and *UL* = is previous $EAV^* \times 1.1$

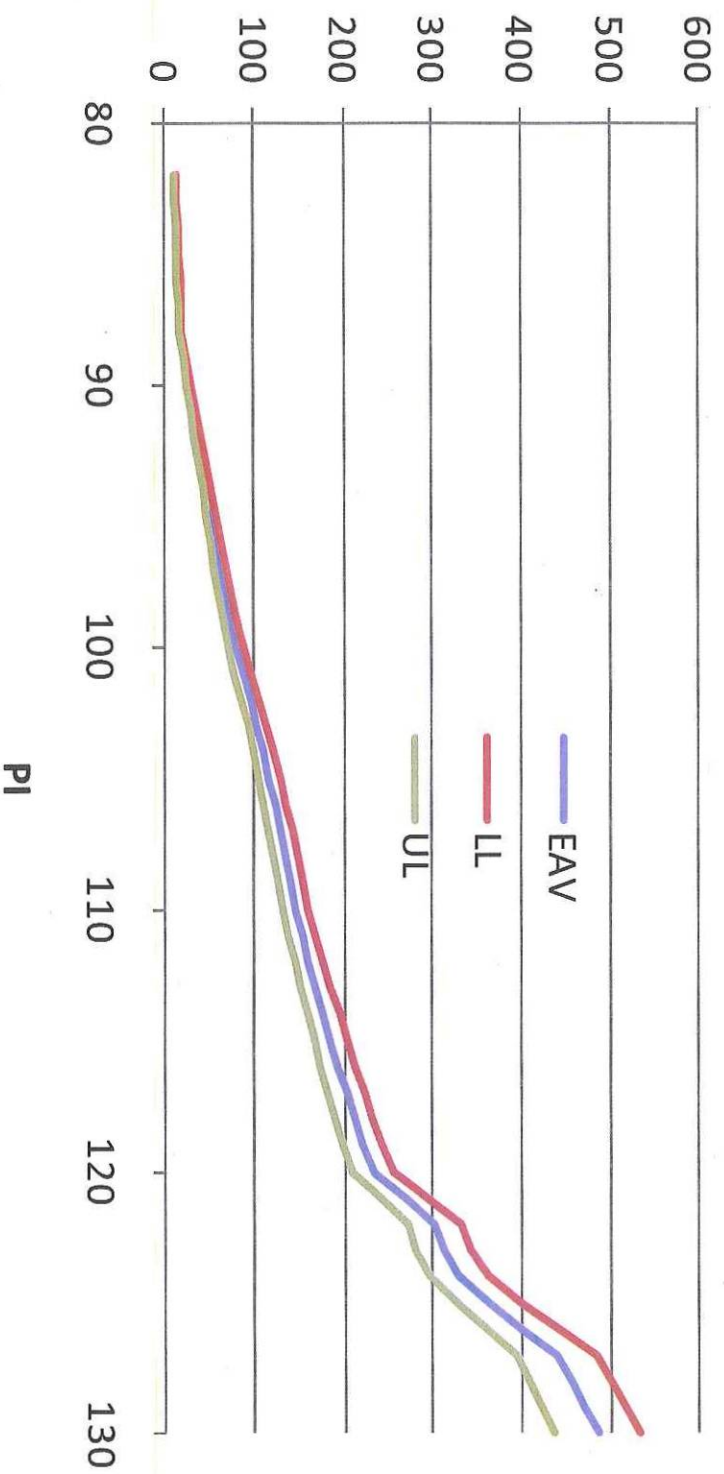
Seems like a 10% limitation at first glance, right?

Illinois Farmland Assessments (*continued*)

- Repeated application of 10% limit, and other historic artifacts has resulted in a highly “kinked” relationship between PI and EAVS with low end “stuck” in narrow band.
- Higher productivity soils not constrained as much
 - 10% of \$10 is a small change. 10% of \$500 can matter.
- Cap Rate changes have been minor (less variable than comparable point on yield curve) but will matter in future (see later slide).

Change Limits have resulted in kinks and curves in Certified EAVs (the ones that matter to tax bills)....

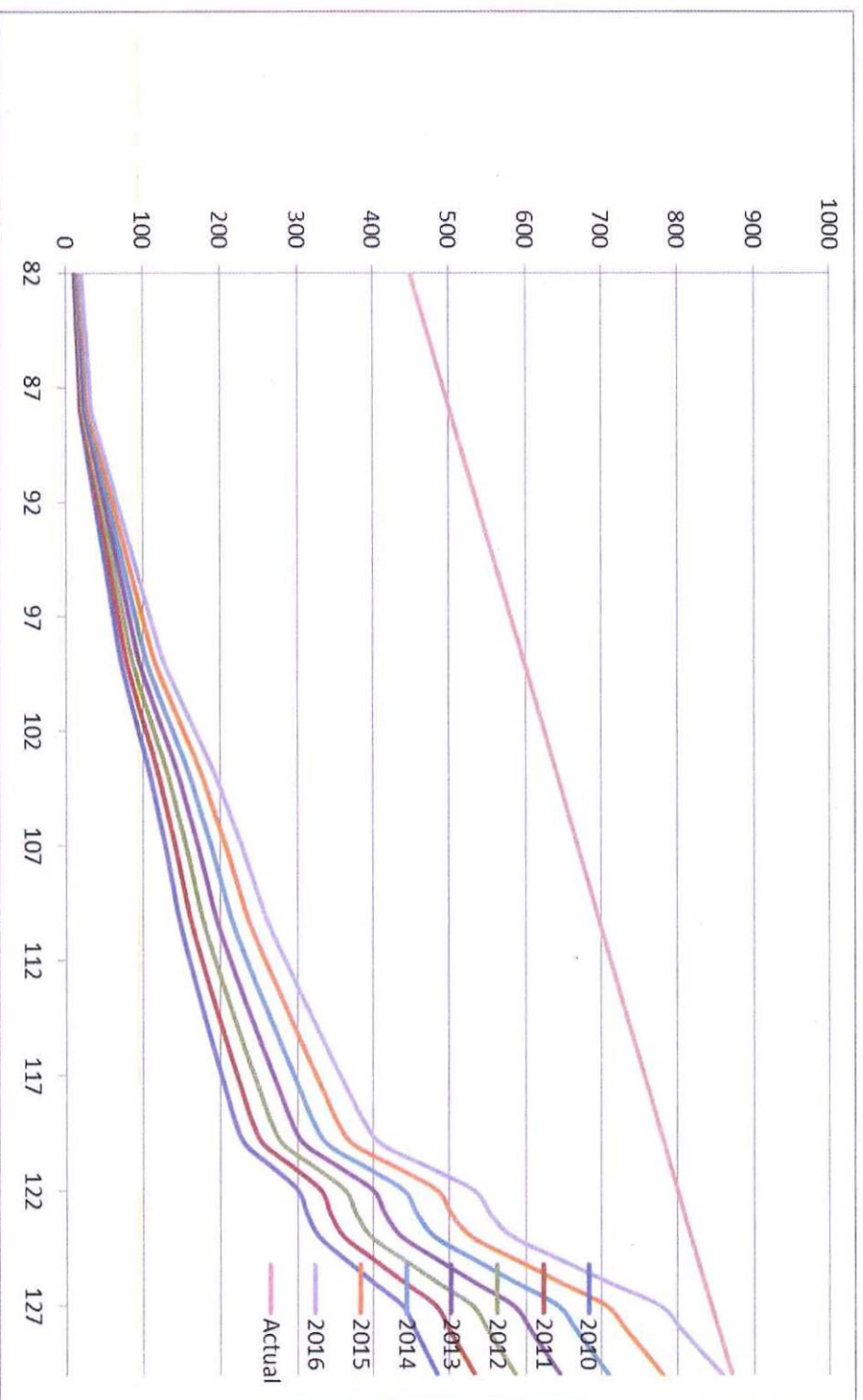
Certified EAVs and Limits (2011)



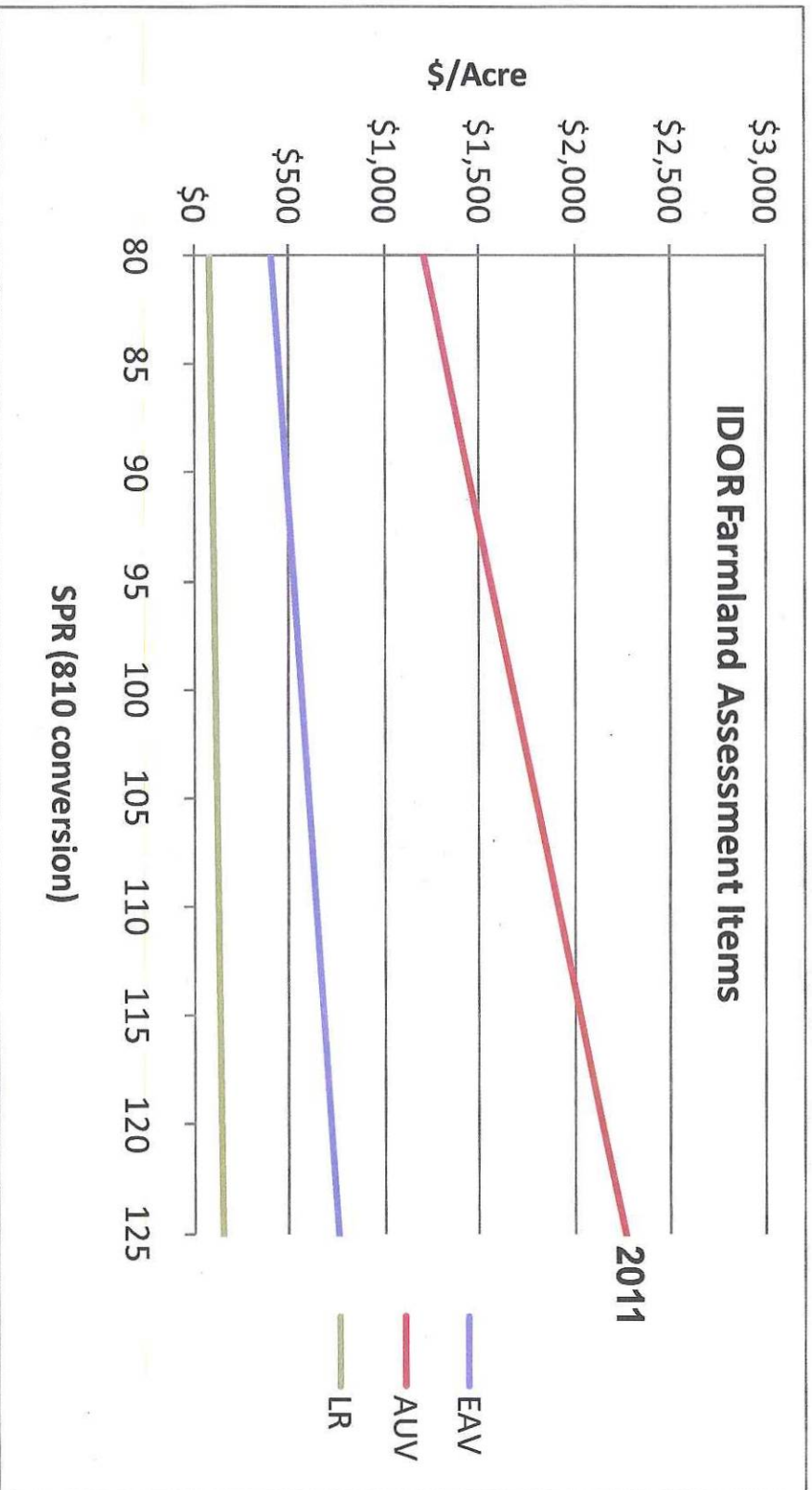
Illinois Farmland Assessments (*continued*)

- Fact that the calculated EAVs are generally well above the certified can lead to worse relative certified EAVs through time. Many taxing bodies at Extension Limitation (thus, can't raise rates).
- Examining alternatives to implementing rate change limitations.
- PTELL separately addresses rate of increase in EL, **not** part of this set of calculations.
- Woodlands a separate issue as well.

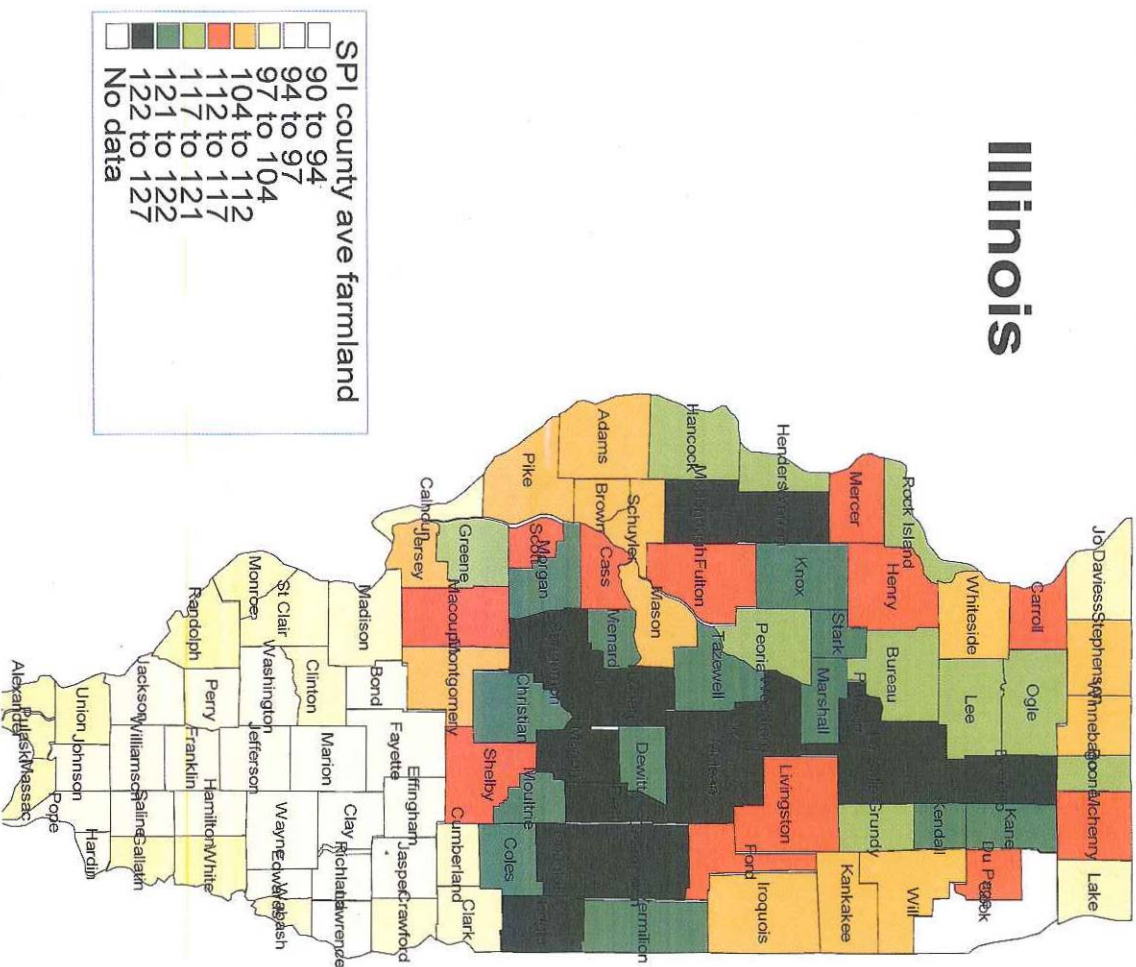
Relative disparity gets worse.... Income ratio and value ratio of 2:1 has assessment ratio of 60+



Calculated EAVs make sense and have about the right ratio from low to high PI points – not a calculation issue

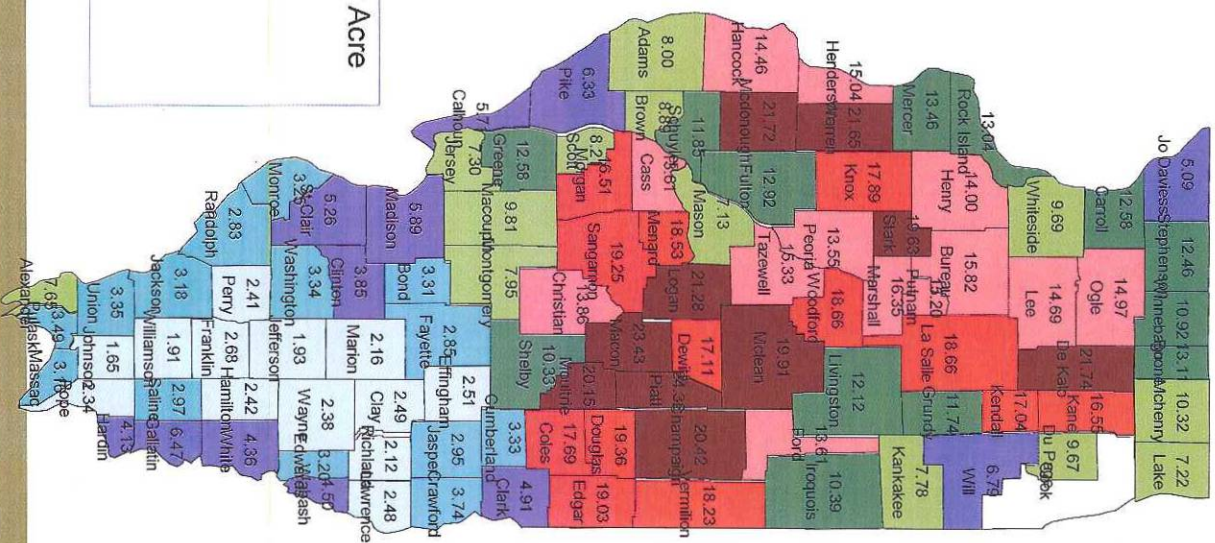


Illinois



[illegible]

Map of the 100th Precinct in New York City, showing the distribution of 100,000 votes across various precincts. The map is color-coded by precinct, with colors ranging from green to red. The precincts are labeled with names and vote counts. The map is oriented with the Hudson River to the left and the East River to the right. The precincts are numbered 1 through 100. The map is titled '100th Precinct' and '100,000 Votes'.



% Extensions from farmland

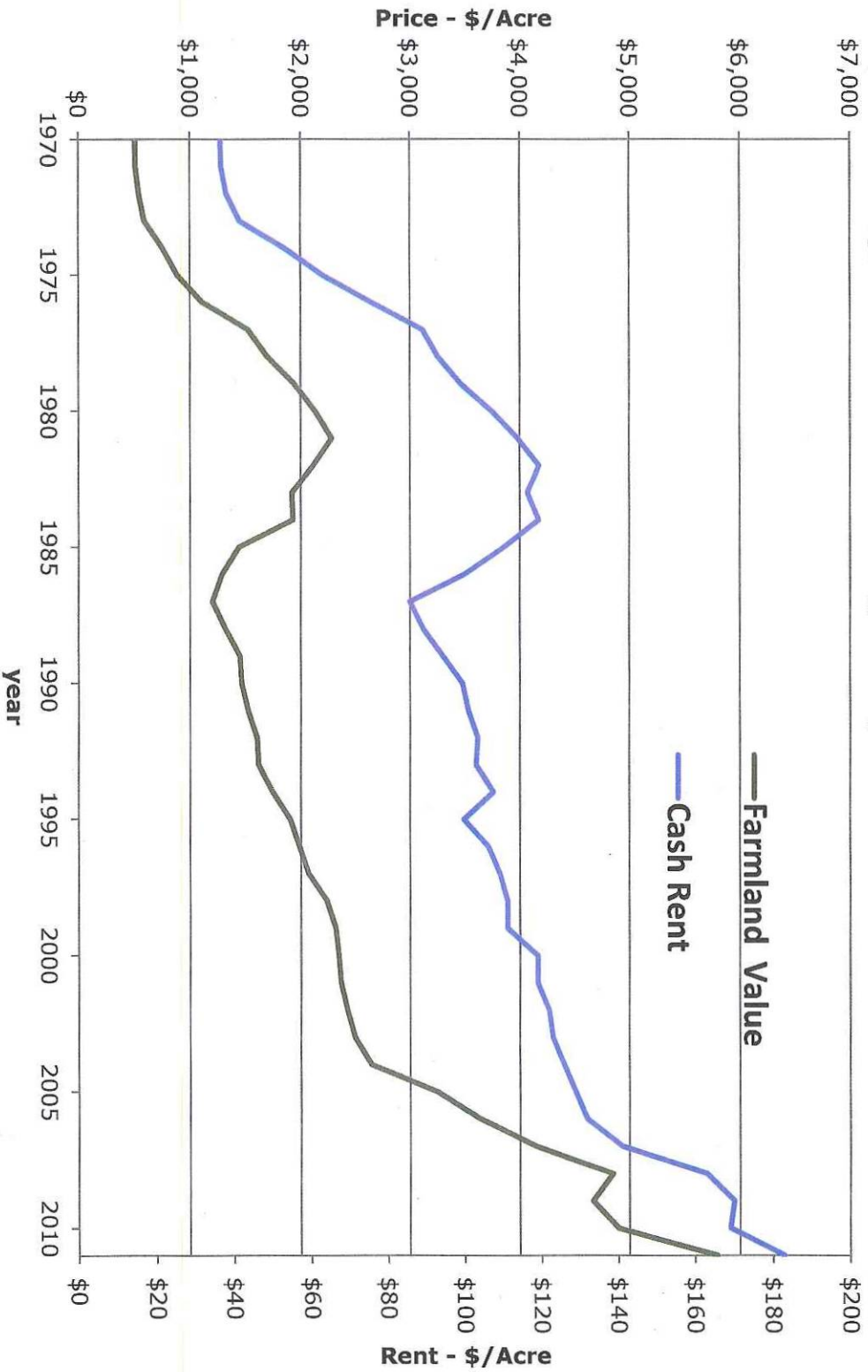
Illinois

% Farm Extension of Total

Color	Percentage Range
White	0% to 6%
Light Yellow	6% to 11%
Yellow	11% to 16%
Orange	16% to 20%
Red	20% to 26%
Dark Red	26% to 30%
Black	30% to 39%
Dark Green	39% to 53%
No data	No data

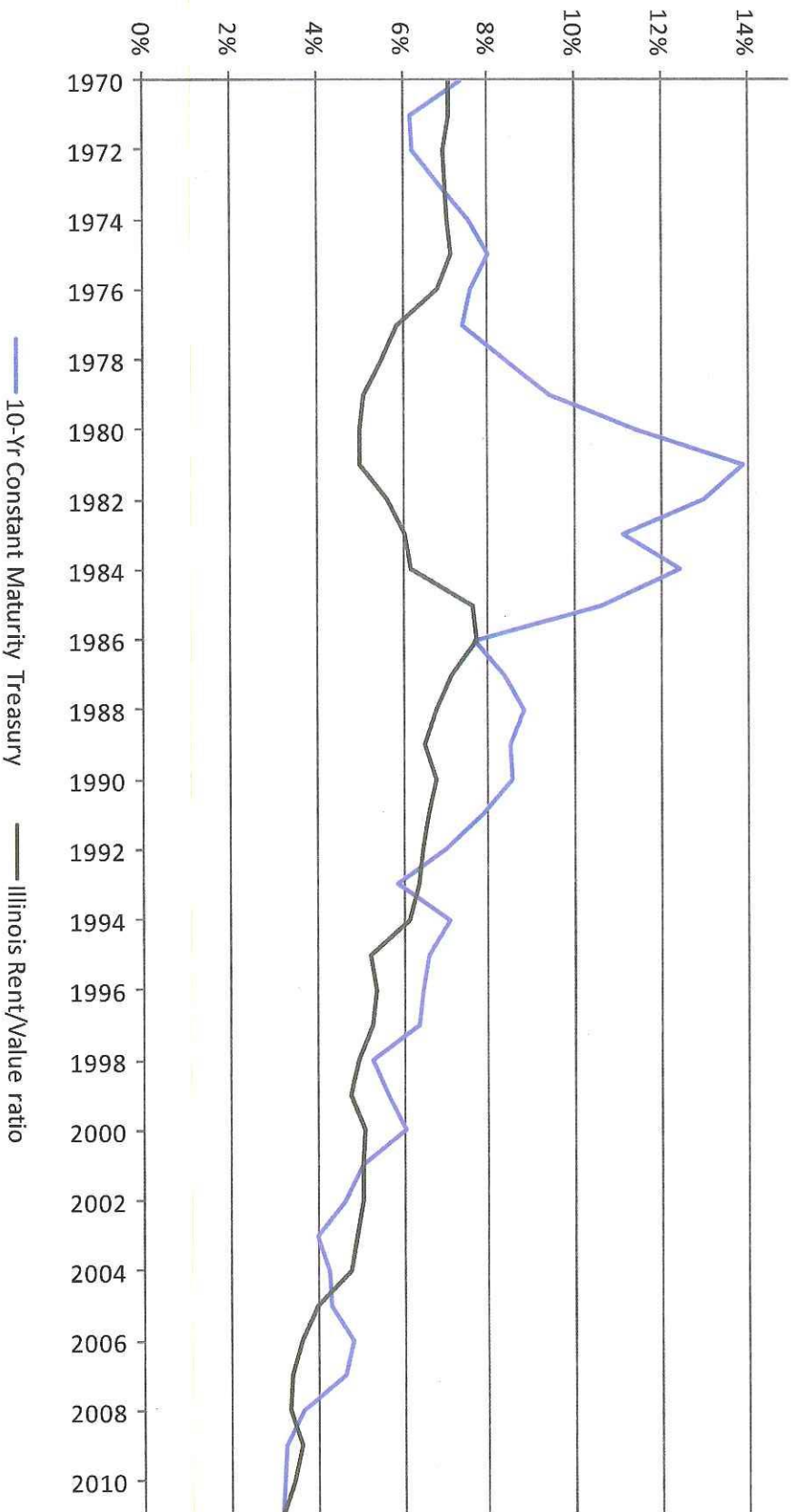
Counties shown on map: Adams, Alexander, Anderson, Boone, Brown, Calhoun, Cass, Carroll, Champaign, Clark, Clay, Clinton, Coles, Cook, Crawford, De Kalb, Du Page, Effingham, Elgin, Hancock, Henderson, Henry, Iroquois, Jackson, Jasper, Jersey, Johnson, Kane, Kendall, Kankakee, Knox, La Salle, Lee, Lincoln, Logan, Madison, Macoupin, Mahanoy, Marion, Marshall, Mason, McHenry, McLean, Mercer, Monmouth, Morgan, Moultrie, Newton, Ogle, Peoria, Perry, Pike, Platte, Randolph, Sangamon, Shelby, Smith, St. Clair, Taylor, Tazewell, Union, Vermilion, Whiteside, Will, Winnebago, Woodford, York.

How does income potential relate to farm value through time? One proxy would be cash rent.



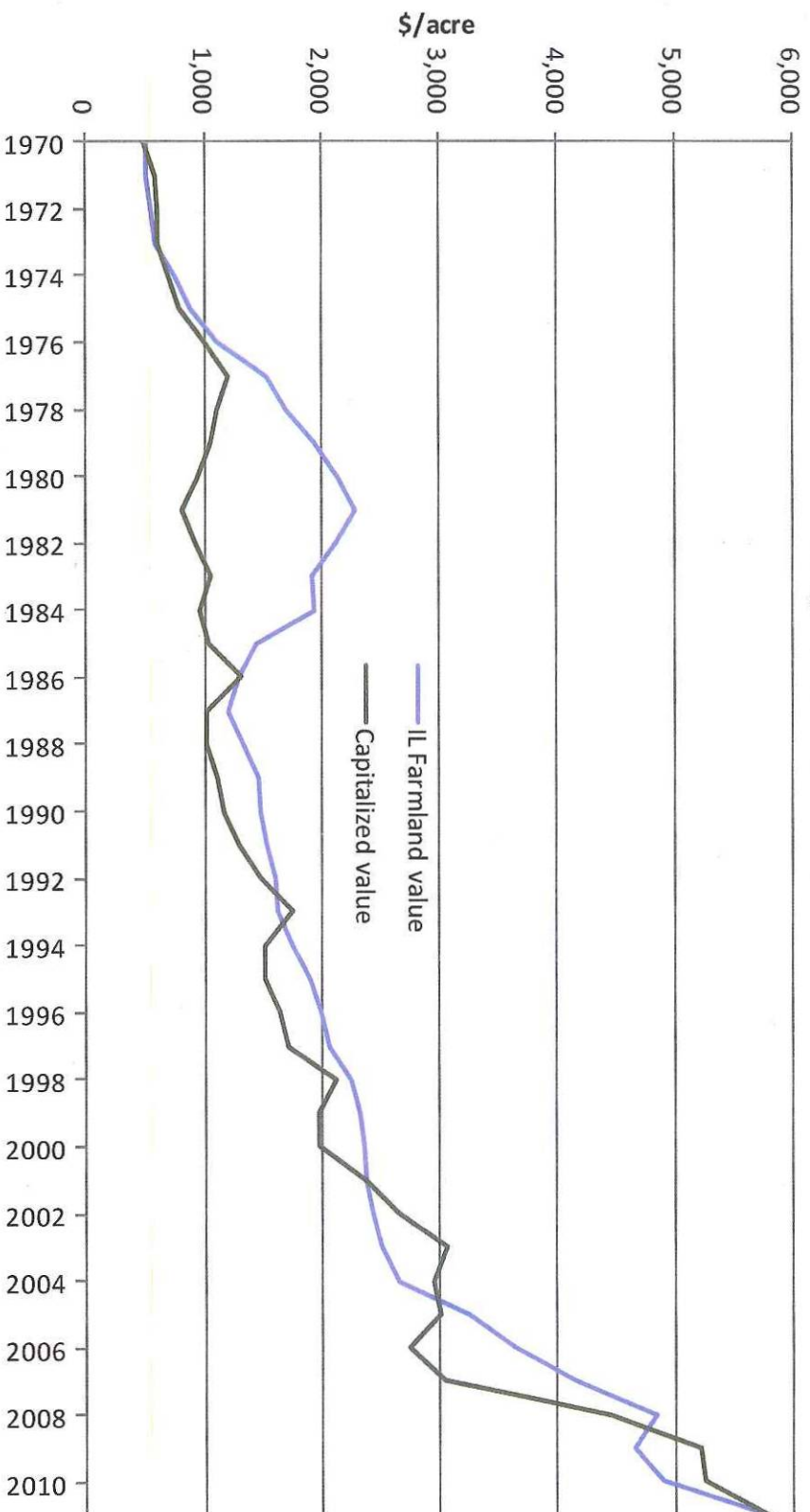
Does the Land Market make sense?

Illinois Farmland Rent/Value

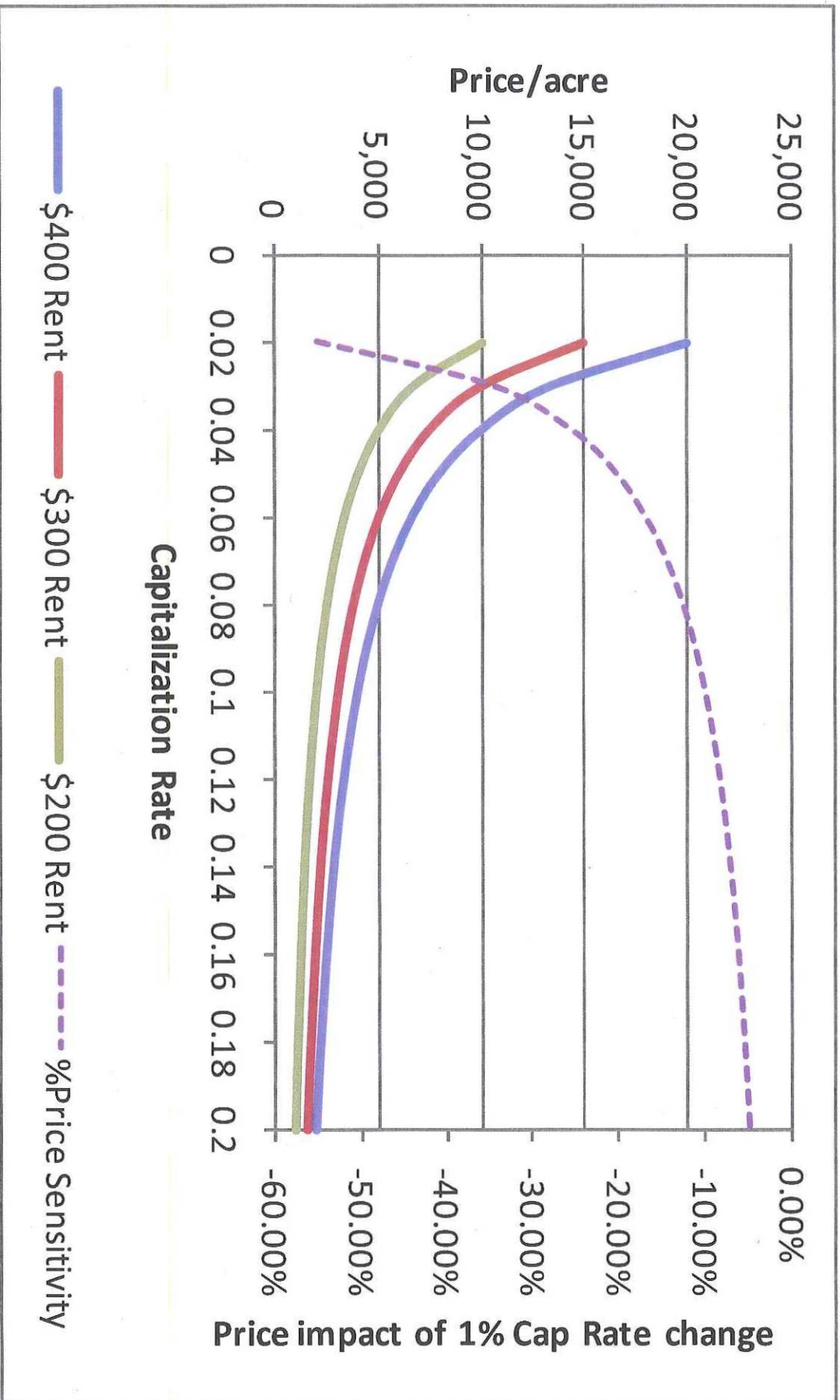


Does the Land Market make sense?

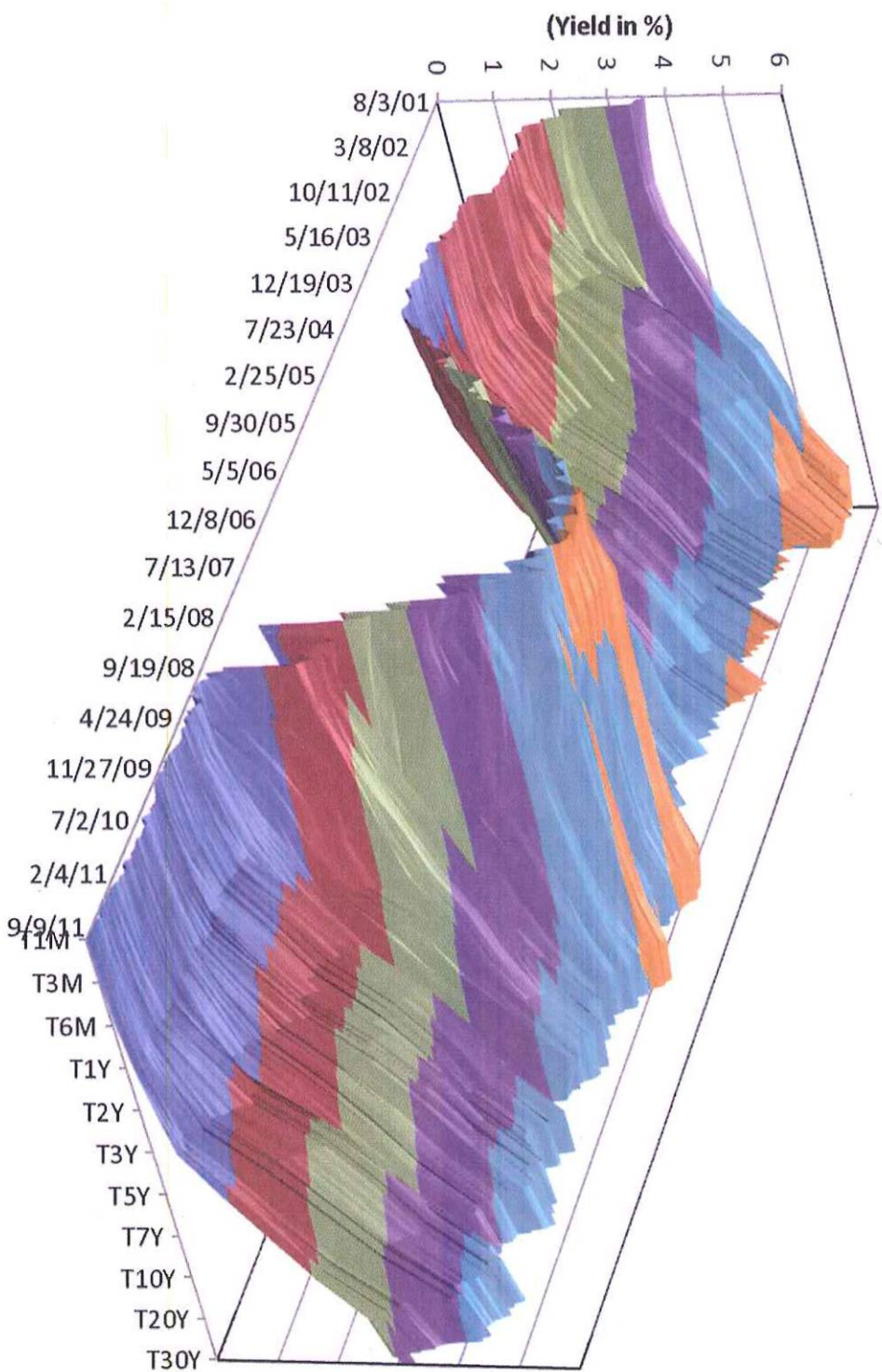
Comparison of IL Farmland Value and
Capitalized Value



What are the largest risks?



Yield Curve and Cap rate issues



Example Utility for Counties' Use



Case Identifier
PIN

Champaign - Busey Royal M et. al
25-15-18-200-001

Calculated AUV equivalent	\$294,404.88
Per Acre AUV equivalent	\$3,717.23
Per Acre EAV equivalent	\$1,239.08
Acres Entered	79.2

Enter information in yellow shaded boxes below

	Soil ID	SEF	Acres	Soil Name	PI	Adj. PI
1	149 A		3.98	Brenton silt loam	125.1	125.1
2	679 B		2.41	Blackberry silt loam	126.0	124.7
3	56 B		16.63	Dana silt loam	116.0	114.8
4	152 A		55.34	Drummer silty clay loam	127.3	127.3
5	56 B		0.84	Dana silt loam	116.0	114.8
6						

Other Tools at:

Farm.Analysis.Solution.Tools

- Real Estate Purchase Analysis
- Soil Productivity Utilities
- Farm Rent Evaluator
- Lease Form Templates
- Other *farmdoc* resources
 - url: www.farmdoc.illinois.edu

Thanks!

sherrick@illinois.edu

Control composition changing

